

The upper floor and the ground floor are devoted to the laboratories and research rooms; the east wing of the upper floor is reserved for arts and science students, and the west wing for medical students. The junior arts and science laboratory has accommodation for forty-five students, and is fitted with tables, benches, and wall apparatus for introductory experimental work; on one side is a long gallery for optical work. The senior laboratory will accommodate forty students, and consists of three rooms for mechanical, thermal, and electrical work, two rooms for optical work, and two for sound. Between these two sets of laboratories is a research room for the chief laboratory assistant, and adjoining them is a small workshop with benches, lathe, glass-blowing table, &c.

On the ground floor are the research rooms; at present only five are to be fitted up; the remainder will be equipped and brought into use as funds permit. These rooms have firm concrete floors, have stone shelves built into the thick, solid walls, and are supplied with high- and low-pressure water, gas, electric currents, &c., and in certain of the rooms, by the use of copper and brass piping, and by other precautions, provision has been made for work with delicate electrical instruments. On this floor are also the accumulator room, a large workshop and forge room, and a constant-temperature room.

The tower, 89 feet in height, has been utilised for suspension of long wires, mercurial pressure-gauge, and other purposes requiring considerable height, and, lastly, on the roof a floor space, 24 feet by 12 feet, has been arranged for open-air experiments.

Engineering Buildings.

The accompanying illustration (Fig. 2) shows the west end of the block of buildings for the engineering department.

The building is T-shaped, the head of the T facing west. In the head of the T, on the ground floor, are provided large laboratories for the testing of materials (42 feet by 30 feet) and for hydraulics (51 feet by 30 feet). The first floor is devoted mainly to a laboratory for experimental work, which does not require heavy machinery (73 feet by 25 feet). On this floor are also a small lecture room, the departmental library, and the private rooms for the staff.

The back block of the building is also divided into two floors—the lower forms the lecture theatre and the upper the drawing office. The lecture theatre will seat about 120 students, and on the lecturer's table are all the needful appliances for experimental demonstrations, there being steam, gas, and electrical connections. There are also the necessary appliances for darkening the room in order to allow of the free use of lantern demonstrations. The drawing office is a fine room, about 45 feet square, lit entirely from the north and east, the roof being of the saw-tooth pattern, the floor space giving room for about sixty independent drawing tables. Special rooms have also been set aside for blue-print work and photography.

A workshop and heat laboratory (48 feet by 42 feet) has been provided for by roofing in and connecting to the main building a piece of ground lying in the north-east angle between the front and back blocks. The workshop and laboratory contains examples of all the ordinary machine-tools, gas-engines, steam-engines, and other plant for experimental research in connection with thermodynamics.

The building is heated by hot water and by steam; an independent boiler house has been constructed for this purpose, with two large boilers.

A considerable amount of additional apparatus has been installed in these new buildings. The testing laboratory

now contains a 100-ton Buckton machine, with the necessary electric motor, pump, and accumulator; a 60,000-lb. Riehle machine; an Amsler 100-ton machine, specially designed for compression and bending work; and a complete installation for the testing of cements, mortars, &c.

In connection with the hydraulic laboratory, a water tower has been constructed at the south-east corner of the building; at the top of this tower is a large cast-iron tank holding about 10,000 gallons, and giving a head of 65 feet above the floor-level of the laboratory. The floor of the laboratory is on two different levels; on the upper level are placed the various turbines, water-wheels, and other hydraulic machines on which experimental investigations will be carried out. The water discharged from these machines passes into one or other of three rectangular channels formed in the floor, and the quantity is measured by allowing the water to pass over weirs. The water then flows into one or other of two large rectangular tanks, each 11 feet square by 5 feet deep, sunk below the lower floor-level of the laboratory, where it is measured again by floats, with rods moving in front of carefully graduated vertical scales. From these lower measuring tanks the water is lifted by an electrically driven 20 h.p. centrifugal pump back to the storage tank in the water tower. The



FIG. 2.—Entrance and West Front of new Engineering Department, University of Edinburgh.

hydraulic equipment includes a Venturi meter and other forms of meters, and a considerable amount of other apparatus for experimental work.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The geographical scholarship for 1906 has been awarded to Mr. N. de Lancey Davis, Jesus College.

Mr. J. A. Brown, New College, has been appointed demonstrator in the laboratory of the Wykeham professor of physics.

The following elections have been made at Jesus College:—to scholarships in natural science, G. I. Wishart, Wilson's Grammar School, London, S.E., and H. E. Jones, County School, Towyn; to exhibitions in natural science, R. Atkin, Nottingham High School, and A. D. Phoenix, Grove Park School, Wrexham.

CAMBRIDGE.—The following recommendations, contained in a report of the special board for mathematics on the mathematical tripos, received the sanction of the Senate at a congregation held on October 25:—(1) A student may be a candidate for part i. of the mathematical tripos

at a date not earlier than his second term and not later than his seventh term. (2) A student who fails to obtain honours in part i. of the mathematical tripos may be a candidate on a second occasion, provided he then be otherwise qualified. (3) The examination for part i. shall comprise the subjects in the schedule annexed to the report. (4) The list of successful candidates in part i. shall be arranged in three classes, the names in each class to be arranged alphabetically. (5) The examination for part ii. shall comprise the subjects in the Schedules A and B annexed to the report, together with certain questions partly on the subjects of the schedule for part i. (6) The list of successful candidates in part ii. shall be arranged in the three classes of wranglers, senior optimes, and junior optimes, the names in each class to be arranged alphabetically. (7) In the examination for part ii. the class in which a candidate is placed shall be in general determined by his performance in the papers on the subjects of Schedule A, a mark of distinction and a mark of proficiency being awarded to those candidates who acquit themselves with sufficient credit in the subjects of Schedule B.

The Senate will be asked on Saturday, November 3, to assign a site in Free School Lane for the proposed extension of the Cavendish Laboratory, and to appoint a syndicate to consider the assignment of a site for the extension of the chemical laboratory. Lord Rayleigh's munificent gift of 5000*l.* out of the Nobel prize will go toward the cost of the new building for physics. It will be remembered that the balance of the prize was given by Lord Rayleigh to the University library fund. The extension of the chemical laboratory is called for because Gonville and Caius College are proposing to close their chemical laboratory at the end of the academic year.

THE Cairo correspondent of the *Times* states that considerable interest has been aroused there by a proposal to found a national university, modelled on European lines, and independent both of the Ministry of Public Instruction and of the mediæval foundation of Al Azhar. A committee, which includes the leaders of the progressive Mohammedan school of thought, has been formed to draft a programme of courses and to raise the sum of at least £500,000 which will be required to make the university a reality. In an appeal for public support, Kassim Bey and the other promoters of the scheme outline its features. The courses of the proposed foundation are to be literary and scientific, open to all without distinction of nationality or creed. Diplomas will be granted to students fulfilling conditions of attendance and passing the requisite examinations, and no attempt will be made at the outset to encroach upon the primary, secondary, and technical instruction imparted by the various Government schools.

LORD ROSEBERY, as Chancellor of the University of London, on October 26 performed the ceremony of opening the library of the University. After expressing the gratitude of the University to the Goldsmiths' Company, which spent 15,000*l.* in securing and supplementing Prof. Foxwell's library, and explaining the growth of the University library as a whole, Lord Rosebery, among many other subjects of wide interest, spoke of the functions of a library. He said there is no greater misconception of a library than to think that it can take the place of a university. "No doubt a student must be fed by books; it is impossible for the student to proceed far without books; but I will urge a further consideration which I should think the experience of those of my age who are present will tend to confirm—that the mere habit of reading, and often of reading copiously, without any exercise or output for their knowledge, is injurious rather than beneficial to the mind. It is apt to produce a condition of mental debility, if not of mental paralysis. I hope that no students will ever believe that the library of this University is intended as more than a staff and an assistance, and not in any degree as the object of their training at this University."

MR. HALDANE, as is appropriate to the president of the British Science Guild, avails himself of every opportunity to insist upon the value of knowledge and of scientific habits

of thought in every sphere of human activity. Distributing the prizes and certificates to the students of Birkbeck College on October 26, Mr. Haldane said there is a danger which is inseparable from a college such as the Birkbeck College. It is largely attended by those who have their bread to win, and whose main concern must be to win it and to win the leisure for learning. The temptation becomes very strong in such a case to look upon learning as being what the Germans call a *brodwissenschaft*—a scientific means of increasing the opportunities for earning a living. That is a very cramping view, and one fatal to the higher learning. But it is the higher learning that pays in these times—not the learning which is a means to an end, but the learning which is an end in itself. Learning for learning's sake, that is the key to a career. Not every person who has learning is necessarily successful in his career; but, other things being equal, the man who is penetrated with the spirit of the scholar has a far better chance in the race of life than the man who is not so penetrated. What is true of individuals is true of nations. A few years ago Japan was reckoned with those who were not civilised. To-day, by singleness of purpose, by concentration upon science, by the dominant purpose of the nation to fashion its national character according to the highest ideas, Japan has leapt, at a bound almost, into the front rank. Germany, too, has gone forward stride after stride on the basis of scientific re-organisation. These are lessons that we do well to bear in mind.

A NEW hall and buildings in connection with University College, Reading, were opened on October 27 by Mr. Haldane, Secretary of State for War. As has been noted in these columns, the new site was secured as a gift of Mr. Alfred Palmer, and the new buildings now opened bring the council an important step nearer the completion of its scheme for a fully-equipped college. The principal feature of the new buildings is the great hall in which the ceremony took place. The science laboratories and art studios consist of seven separate buildings, and accommodation is provided for theoretical and practical work in biology, agriculture, physics, chemistry, and geography. Mr. Haldane, in the course of his speech declaring the new hall open, said:—"It is impossible to set up technical education successfully on anything but the broadest basis of culture. It is distressing to consider, not only how small a part the State has played in higher education in this country, but how misplaced its intervention at times has been. The present Government proposes to spend an extra 1,000,000*l.* a year on elementary instruction, and the late Ministry spent more than that sum additionally for the same purpose, but these payments arose out of controversies which had little to do with education. The Government is doing something for the higher teaching, but its capacity is limited by what the people will allow. There is already a great awakening in this country with reference to higher instruction, but it is due to private donors far more than to the public generally. The War Department wants several things dependent on education. It desires a great reserve of officers, and one thing that it is considering at this moment is how to get the universities and university colleges to assist it. A great misfortune has come to the Army of late through the revelation, in relation to the South African War, of an altogether inadequate organisation and training, inadequate to cope with the great business of supply in time of war and the period following war. Supply is a science by itself, which requires high training if the country is not to be victimised by contractors and everything is to be placed where it is needed. The Army has organised its General Staff, which requires officers with the highest class of instruction for strategy, tactics, and general command. This is one side of military education, but there is an administrative side also, and up to now no steps have been taken to give the highest education to administrative officers. The Government has decided to train a school of administrative officers up to the high level that it is trying to attain for staff officers. A certain number of officers will study at the London School of Economics, and it is hoped that they will form the nucleus of an administrative staff as capable as the general staff, whether of our Army or any other.